

# Your Lung Surgery



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Patient name

---

Surgery date

---

Arrival time

Special instructions: \_\_\_\_\_

---

Health history and physical exam: \_\_\_\_\_

date

time

---

Surgeon

---

Phone number

---

Nurse navigator

---

Phone number

**Please bring this book to all appointments with your doctor.**

# Your Treatment Plan

**Date:** \_\_\_\_\_

**Plan:**

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

7. \_\_\_\_\_

8. \_\_\_\_\_



# Your Lung Surgery

*Third edition*

**Developed by Allina Health.**

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The publisher believes that information in this manual was accurate at the time the manual was published. However, because of the rapidly changing state of scientific and medical knowledge, some of the facts and recommendations in the manual may be out-of-date by the time you read it. Your health care provider is the best source for current information and medical advice in your particular situation.

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This publication is for general information only and is not intended to provide specific advice or recommendations for any individual. The information it contains cannot be used to diagnose medical conditions or prescribe treatment. The information provided is designed to support, not replace, the relationship that exists between a patient and their existing physician. For specific information about your health condition, please contact your health care provider.





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# Chapter 1: Introduction and Anatomy

## Your Surgery

This book explains what will happen during your surgery and what to expect during your hospital stay and when you go home.

The right surgery for you depends on the location and size of your nodule or mass, and your overall health. Your surgeon will explain which surgery is right for you.

## Your Health Care Team

A health care team will partner with you during your treatment. Your team will include many health care providers who, along with you, will create your health care team. You are the center of your health care team.

Members of your health care team may include:

- **Advance practice provider**

An advance practice provider can treat illnesses and diseases such as cancer. An advance practice provider and doctor work together as a team. Advance practice providers include clinical nurse specialists, nurse practitioners and physician assistants.

- **Chest (thoracic) surgeon**

A chest (thoracic) surgeon does surgery on organs in the chest including the heart, lungs and esophagus.

- **Medical oncologist**

A medical oncologist is a doctor who will meet with you if your treatment plan includes medicines. These medicines may include chemotherapy, targeted therapies (such as immunotherapy) or other medicines. These medicines are usually given through an intravenous (IV) line.

- **Nurse navigator**

A nurse navigator is a registered nurse who will support, educate and guide you through your course of treatment. Your nurse navigator will be part of your health care team from diagnosis through treatment and on to healing and survivorship.

- **Oncology clinic nurse**

An oncology clinic nurse works with doctors in medical oncology or radiation oncology to review and coordinate your care. Your nurse will educate you about your cancer treatment and help you manage symptoms.

- **Primary care provider**

Your primary care provider will have access to all of your treatment information. You will keep visiting your primary care provider for your usual health care needs.

- **Pulmonologist**

A pulmonologist treats lung problems and conditions.

- **Radiation oncologist**

A radiation oncologist is a doctor who will meet with you if your treatment plan includes radiation therapy.

- **Radiologist**

A radiologist is a doctor who specializes in interpreting images to diagnose and treat diseases. They will use computed tomography (CT exam), magnetic resonance imaging (MRI), positron emission tomography (PET) or other imaging tests to look at images of the cancer.

- **Scheduler**

A scheduler will help you schedule your appointments, tests or surgery.

- **Social worker**

A social worker will support you and your family by providing emotional support and information on resources you may need such as financial assistance, transportation or a health care directive.

- **Surgery clinic nurse**

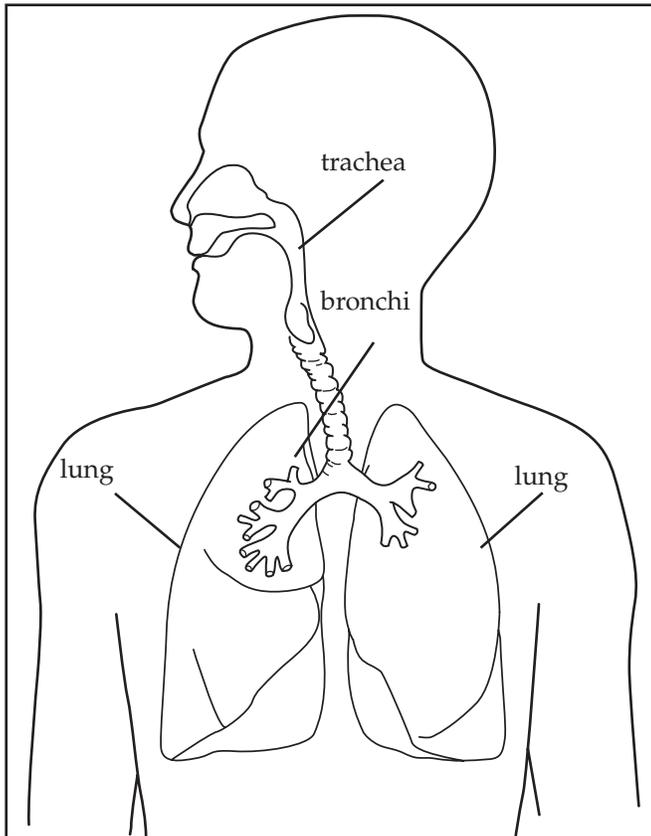
A surgery clinic nurse works with your surgeon to review and coordinate your care.

You may also come in contact with other health care providers, including integrative health, spiritual care and respiratory care.

# Normal Lungs

Healthy lungs come as a pair. The lungs do not have muscles but they expand (get bigger) and contract (get smaller) as the diaphragm and chest wall muscles move.

Here's how oxygen travels deep into your lungs and bloodstream.



© Allina Health System

**Your lungs exchange oxygen and carbon dioxide (waste) between the air and your bloodstream.**

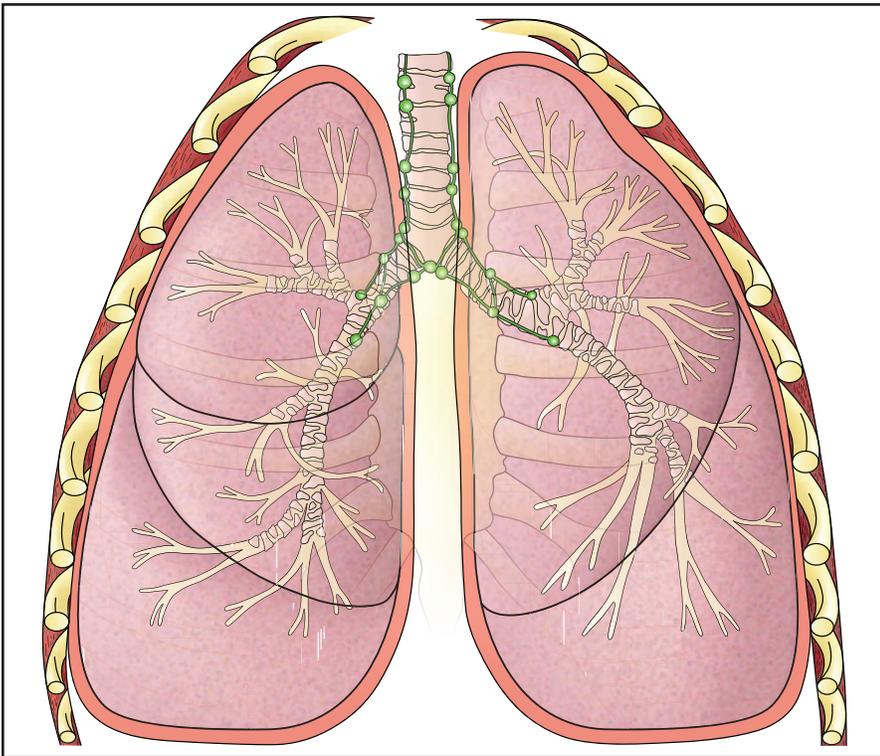
## Did You Know?

- An average adult's lungs hold 6 liters of air.
- An inflated lung is the size of a football and weighs 1 pound.

- As you inhale (breathe in), oxygen (air) enters your body through your nose or mouth.
- The air comes together in the back of your throat. This area is called the pharynx.
- The air then passes through your epiglottis (flap that keeps food and water from going into your larynx when you swallow) into your larynx (voice box).
- Oxygen continues down a tube called the trachea (windpipe). The trachea divides into your right and left bronchus. The lower ends of each bronchi divide and branch, looking like an upside-down tree, in each lung.
- At the end of the smallest bronchi are millions of tiny hollow air sacs called alveoli. They are very thin and covered with capillaries (small blood vessels).

When you inhale, air rushes into the alveoli. They expand. The blood takes in the oxygen and releases the carbon dioxide.

- Red blood cells carry the oxygen into the bloodstream. The oxygen-rich blood gets pumped throughout your body.
- Carbon dioxide returns to your lungs through your bloodstream. When the carbon dioxide reaches the alveoli, they deflate and you exhale (breathe out) the carbon dioxide.

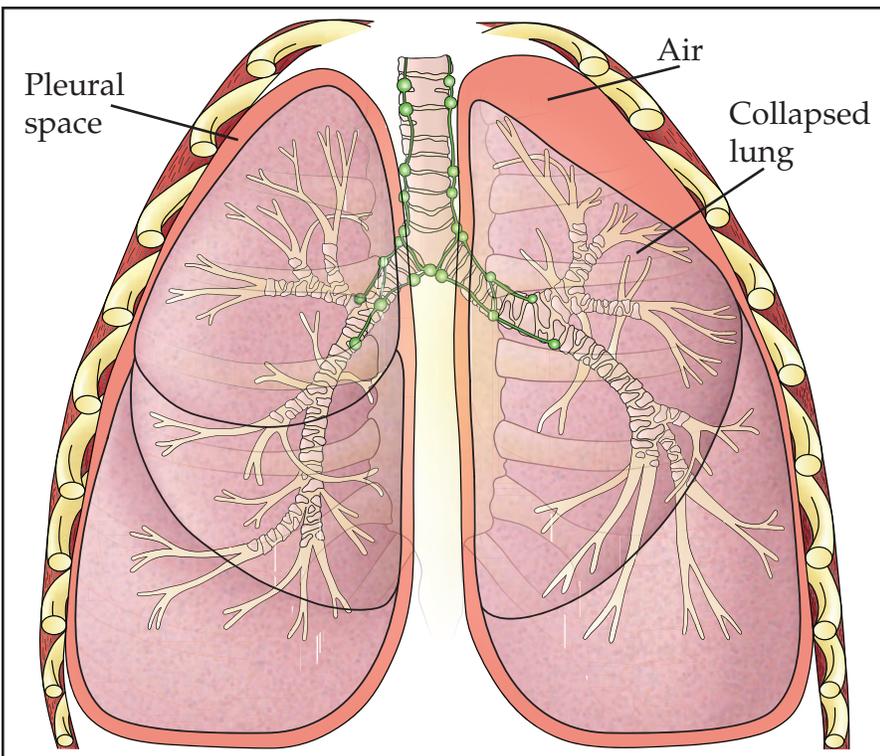


© Allina Health System

Healthy lungs come as a pair. The lungs don't have muscles but they expand (get bigger) and contract (get smaller) as the diaphragm and chest wall muscles move.

You use different sets of muscles when you breathe.

- **diaphragm.** When you breathe in, your diaphragm flattens and increases the size of your chest cavity. This lets your lungs inflate and oxygen comes into the alveoli. The diaphragm is the most important breathing muscle.
- **muscles between your ribs.** They let your lungs expand during heavy activity. These muscles contract and pull your ribs up and out to increase the size of your chest cavity and expand your lungs.
- **abdominal (stomach) muscles.** These muscles are used when you cough, sneeze and breathe out. They push your diaphragm up, causing the alveoli (tiny air sacs) to be squeezed into a small space. This forces the carbon dioxide out of your lungs.



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A collapsed lung (pneumothorax) happens when air enters the pleural space, the area between your lungs and chest wall. A chest tube placed during surgery can help re-inflate the lung.

# Chapter 2: Preparing for Your Surgery

## Diagnostic Tests, Exams or Procedures

### Did You Know?

A diagnostic test, exam or procedure is done to look for problems.

You may need to have one or more of the following diagnostic tests, exams or procedures.

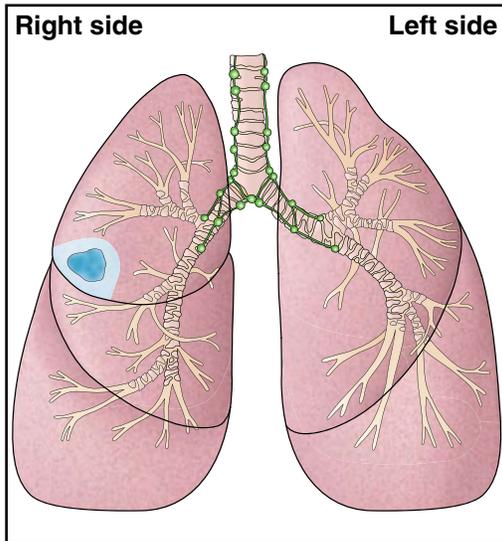
- pulmonary function test
- CT (computed tomography) chest scan
- PET (positron emission tomography)/CT (computed tomography) scan
- brain MRI
- ultrasound-guided biopsy
- CT-guided biopsy
- bronchoscopy
- endobronchial ultrasound (EBUS)
- electromagnetic navigation bronchoscopy<sup>®</sup> (ENB<sup>™</sup>)
- mediastinoscopy
- thoracentesis
- lung ventilation/perfusion scan (VQ scan)
- cardiopulmonary stress test.

A member of your health care team will place additional information about the tests, exams or procedures you need to have in the back pocket of this book.

# Types of Surgery

There are different types of lung surgeries. Your doctor will talk with you about the type of surgery you will be having.

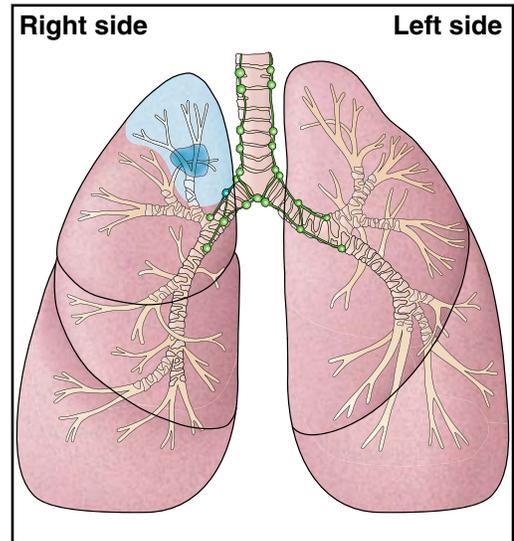
## Wedge resection



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The nodule or mass and some normal tissue around it is removed.

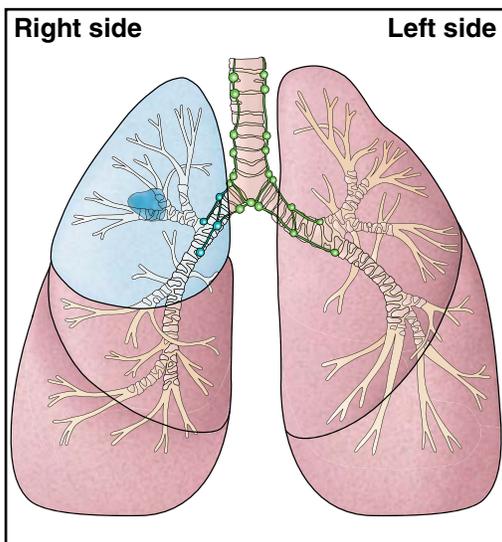
## Segment resection



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The nodule or mass and a larger portion of normal tissue around it is removed.

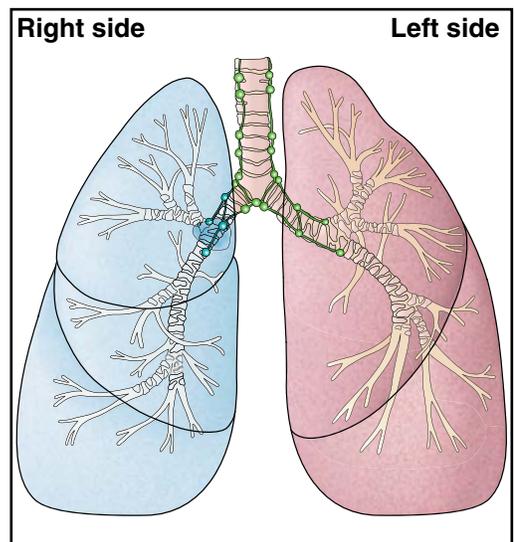
## Lobectomy



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An entire lobe of lung is removed.

## Pneumonectomy



© Allina Health System

An entire lung is removed.

# How Surgery is Done

There are different ways that lung surgery can be done. Your doctor will talk with you about how your surgery will be done.

## Minimally Invasive Chest Surgery

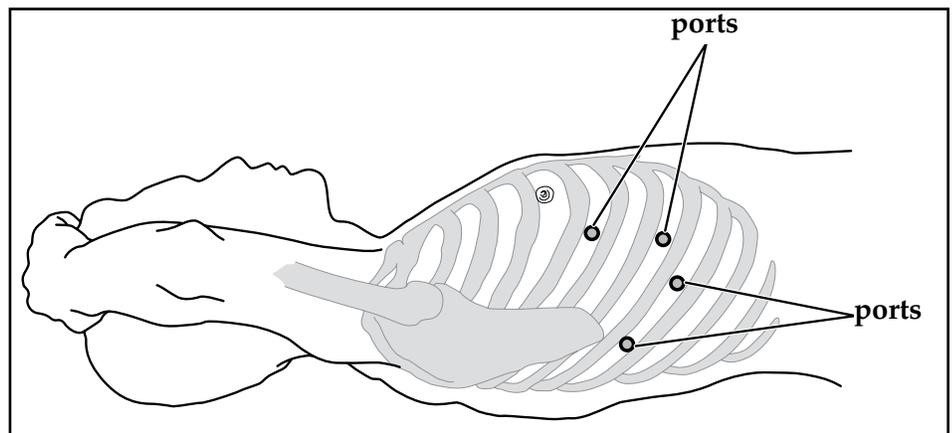
Minimally invasive chest surgery is also called video-assisted thoracoscopic surgery (VATS or robotic-assisted surgery).

### Video-assisted thoracoscopic surgery (VATS)

Small incisions will be made in your chest between the ribs. Your surgeon will insert an endoscope (thin, flexible, lighted tube) to see your lungs and use surgery instruments to remove the tissue or mass. There is no rib spreading during this surgery.

### Robotic-assisted surgery

A surgeon uses a special computer to control surgical instruments with robotic arms during the surgery to remove tissue or a nodule or mass. Small incisions will be made in your chest between the ribs. There is no rib spreading during this surgery.



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**The ports (incisions) are placed between your ribs. Your ports may be placed in slightly different locations.**

As with all surgeries, there are risks of complications (problems). These may include:

- pain or numbness at the incision site
- bleeding
- infection
- abnormal heart rhythm
- pneumonia
- air leak from the lung.

Your surgeon will talk with you about the possible complications.

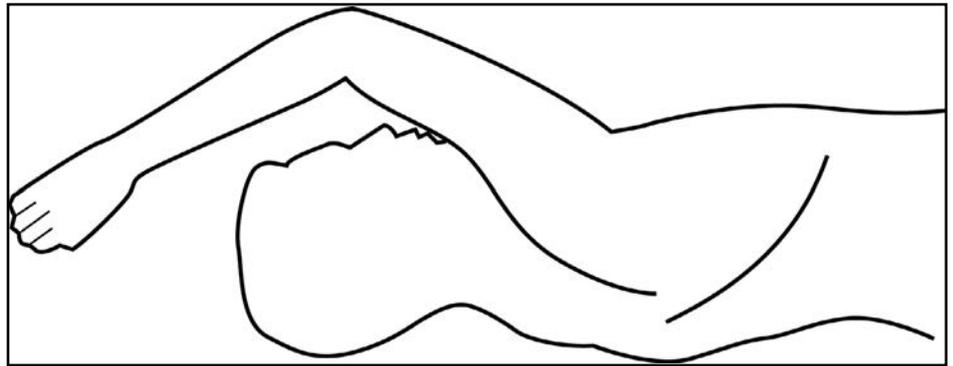
## Thoracotomy

One larger incision will be made between your ribs. The ribs are then spread apart, allowing the surgeon to access your lungs and chest cavity.

As with all surgeries, there are risks of complications. These may include:

- pain or numbness at the incision site
- bleeding
- infection
- pneumonia
- air leak from the lung.

Your surgeon will talk with you about the possible complications.



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**One large incision will be made between your ribs.**

# Chest Tubes

Your surgeon wants to use a chest tube as part of your treatment.

A chest tube is a clear, flexible tube that is usually inserted into the lower side of the chest. It is used to drain fluids, to restore the normal air pressure inside the chest, or both.

- The tip of the tube rests in the space between the lung and the chest wall.
- The chest tube is connected to a disposable drainage container hanging by your bed. Fluids and air from the chest drain into this container.
- By draining fluids and air from the chest, the chest tube helps inflate the lung to improve breathing.
- The chest tube will be attached to suction, which may cause a bubbling sound.

## Discomfort

The chest tube is inserted during surgery. There may be some discomfort at the site. Pain medicine will be available for you to help ease the discomfort.

## What you need to do

It is extremely important for you to do regular deep breathing and coughing exercises while the chest tube is in. These exercises help to drain secretions and air from the chest. They also help prevent other breathing problems.

- Take deep breaths every hour when you are awake.
- Use your incentive spirometer 10 times every 1 to 2 hours. (Your nurse will give you instructions on how to use it.)
- A nurse will help you when you get up in a chair or when you walk.

## Other information

- You will also have chest X-rays done to check how your lungs are re-expanding. This is usually done in your room until you are able to go to the X-ray Department in a wheelchair.
- Your chest tubes will be removed when your lungs are re-expanded and there is no more drainage from the tube.

# Before Your Surgery

You may be able to schedule your surgery after your appointment with your surgeon. Otherwise, you will receive a call from your surgeon's scheduler with the date and time of your surgery. They will give you other pre-surgery instructions.

If you have not received a call within 2 or 3 days of your surgery planning appointment, or if you have other questions about your surgery, please call your surgeon's office.

## Health history and physical exam

Before your surgery, your primary care provider should do a health history and physical exam. Call your primary care provider to schedule your appointment.

During the exam, your primary care provider will:

- evaluate your current health status
- review and perform any tests needed before surgery
- make sure you are ready for surgery.

**If you take any medicines, make sure your primary care provider gives you instructions for the following:**

- taking your medicines the morning of surgery
- stopping any prescription medicines before your surgery
- stopping any over-the-counter medicines before your surgery, including herbal medicines.

## Activity

During the days before your surgery stay active, walk or continue with your normal exercise routine. This will help your recovery while in the hospital. Your surgeon may recommend that you have some rehabilitation before your surgery. This may include a visit with a:

- dietitian
- smoking cessation counselor
- social worker
- specialist for pulmonary or cancer rehabilitation.

## Nutrition

Good nutrition is important to help with recovery from your surgery. In the days before surgery try to eat a well-balanced diet, including food from all food groups. If you have lost weight you may want to use nutritional supplements to add extra calories.

## Important

Your health history and physical exam needs to be done within 30 days before your surgery.

It is recommended to have the exam done 2 to 4 weeks before surgery.

# Quit Tobacco Before Your Surgery

## Learn More

Maybe you tried to quit tobacco already. Maybe this is your first time.



The good news is there are many ways to quit. It's important to choose methods that appeal to you.

It may take practice to find the best way for you to quit but keep working on it. You can do this!



Visit [allinahealth.org/quit](https://allinahealth.org/quit) to learn more.

## Tobacco and surgery risks

Tobacco products include cigarettes, electronic nicotine delivery systems (ENDS, includes e-cigarettes), cigars, smokeless tobacco (dip or chew), hookahs, pipes, roll-your-own, and oral nicotine products.

Using tobacco increases your risk of the following during and after surgery:

- heart problems
- lung problems (complications) such as pneumonia
- infections such as infections of your surgery site (incision)
- blood clots
- slower healing of your surgery site
- higher levels of pain and more problems with pain control.

Tobacco use keeps oxygen from reaching your surgery site and it can increase your recovery time.

## Benefits of quitting

- Research shows that quitting 4 weeks before surgery can reduce any problems after surgery up to 30 percent.
- People who quit smoking report having better pain control.
- Your body responds quickly to quitting:
  - **8 hours:** the carbon monoxide level in your blood drops to normal. The oxygen level in your blood increases to normal.
  - **48 hours:** Nerve endings start to grow again.
  - **2 weeks:** Your circulation improves and your lung function increases. (Source: World Health Organization.)

## Did You Know?

Using your surgery as a motivator to quit tobacco increases your success rate of quitting for good.

## Nicotine Replacement Therapy (NRT)

NRT can nearly double your chances of successfully staying off cigarettes. It works best if you use it with the help of a doctor or counselor.

Ask your doctor about using NRT around the time of surgery.

Go to [quitforsurgery.com](http://quitforsurgery.com) to learn more.

## When you should quit

Ideally, you should quit as soon as possible. Research shows that:

- the harmful effects from cigarettes begin to go down about 12 hours after your last cigarette smoked
- at least 8 weeks without cigarettes is the best way to reduce problems almost as low as people who do not smoke.

The American College of Surgeons recommends at least 4 weeks without cigarettes.

You should not use tobacco the day of surgery up to 1 week after your surgery. Your doctor may tell you when to quit before your surgery.

If you quit for surgery, you double the chance of staying off cigarettes for good. Many people report they have no cravings while in the hospital.

## Not ready to quit? Consider taking a break!

If quitting tobacco makes you feel nervous and seems overwhelming, consider taking a break or a vacation from tobacco use.

- You will get the physical benefits for the period of time that you are not using tobacco.
- You will reduce your risk of problems during surgery and still increase your chances of a smooth recovery after surgery.

If you can, set a goal to stop using tobacco for 1 month after your surgery. This will allow your body to heal the best after your surgery.

## Ways to quit or take a break

- abrupt stop (cold turkey)
- nicotine replacement therapy (gum, lozenge, patch or inhaler)
- medicines (varenicline and Zyban®)
- behavioral strategies (such as calling a friend or going for a walk)
- aromatherapy (black pepper oil)
- take a break (vacation) from tobacco.

Any step you take without tobacco is going to help you. Small steps are better than nothing!



### Product-specific Resources

- financial aid Nicotrol® inhaler
  - 1-844-989-PATH (7284)
  - [pfizerrxpathways.com](http://pfizerrxpathways.com)
- Plant Extracts aromatherapy
  - 1-877-999-4236
  - [plantextractsinc.com](http://plantextractsinc.com)

## Resources to help you quit

### Allina Health (for your hospital stay)

- Tobacco Intervention Program at Abbott Northwestern Hospital
  - 612-863-1648
- Tobacco Intervention Program at Mercy Hospital
  - 763-236-8008
- Tobacco Intervention Program at River Falls Area Hospital
  - 715-307-6075
- Tobacco Intervention Services at Allina Health United Hospital – Hastings Regina Campus
  - 715-307-6075
- \*United Hospital Lung and Sleep Clinic Tobacco Cessation Program
  - 651-726-6200
- \*Penny George™ Institute for Health and Healing (LiveWell Center) tobacco intervention coaching
  - 612-863-5178

### Other

- Quit Partner
  - 1-800-QUIT-NOW (1-800-784-8669) or [quitpartnermn.com](http://quitpartnermn.com)
  - American Indian: 1-833-9AI-QUIT or [aiquit.com](http://aiquit.com)
  - Spanish: 1-855-DEJELO-YA (1-855-335-3569) or [quitpartnermn.com/es](http://quitpartnermn.com/es)
  - [asiansmokersquitline.org](http://asiansmokersquitline.org)
- online tobacco cessation support
  - [smokefree.gov](http://smokefree.gov)
- American Lung Association/Tobacco Quit Line
  - 651-227-8014 or 1-800-586-4872
- \*Mayo Clinic Nicotine Dependence Center's Residential Treatment Program
  - 1-800-344-5984 or 1-507-266-1930

**\*There may be a cost to you. Check with your insurance provider.**

# Health Care Directive

## How to Get Started

Go to [allinahealth.org/hcd](http://allinahealth.org/hcd).

- Print the form of your choice. Or, ask your health care provider for a copy.
- Read the [guide](#) if you need help filling out your health care directive.

You can also fill out a secure health care directive online. Go to [account.allinahealth.org](http://account.allinahealth.org) to create an account.

## Planning for your future health care

A health care directive is a written document of your health care choices in case illness or injury prevents you from telling them yourself.

Members of your care circle (family, friends or others close to you) and your health care team use this to interpret and understand your wishes, goals and values for future health care.

You can write:

- who you want to make your health care choices (known as a health care agent)
- what kind of care and treatment you do or do not want
- your wishes about the quality of your life.

## What to Bring if You Are Staying Overnight in the Hospital

### CPAP Machine

If you use a CPAP machine, please ask your surgeon if you should bring it with you to the hospital.

Please bring the following to the hospital.

- this education book
- a current list of your medicines (The “My Medicine List” is on page 59 for you to fill out.)
- a copy of your health care directive (if you have one)
- personal care items, such as a toothbrush, toothpaste, denture cleaner, comb, skin care products, deodorant, make-up and shaving kit
- clothing you intend to wear home, including loose-fitting pants, shirt, underwear and socks
- flat shoes or athletic shoes (comfortable, supportive with non-slip soles)
- glasses or contacts (if you wear them) and storage containers
- hearing aides (if you wear them), storage container and extra batteries
- your insurance card, driver’s license or photo ID

For your comfort and convenience during your hospital stay, consider the following.

- robe
- book, magazine or small amount of money to buy newspapers (All rooms have a television and telephone.)
- writing materials.

## What Not to Bring to the Hospital

Please **do not** bring any of the following:

- valuables or large amounts of money
- jewelry (such as rings, a watch or body piercings)
- medicines (bring medicine list only, not the containers).

## Length of Hospital Stay

How long you will be staying in the hospital will depend on the type of surgery you will be having.

**Notes:**

## One Week Before Your Surgery

- **You will need to arrange to have a responsible adult at the hospital during your surgery and then drive you home after your surgery. If you do not have someone to drive you home, your surgery may be canceled.**
- **You will need to arrange to have a responsible adult stay with you for the first 24 hours you are at home.**
- You will receive a call from a nurse. They will review information about your care and answer any questions you may have about your surgery.

## The Day Before Your Surgery

- Tell your doctor if you have any changes in your health (sore throat, cold, fever, dental problem, urinating problem) or skin condition (rash, abrasions, etc.). You may need to schedule your surgery at a later date.
- If you take diabetes medicine, ask the health care provider who is managing your diabetes if you should take your medicine before surgery.
- Bathe or shower using the “Cleansing Your Skin for Your Surgery” instructions on page 27 or as directed by your doctor.

# Food and Liquid Directions Before Your Surgery

These directions are based on your scheduled arrival time. Not following these directions could mean your procedure will be delayed or canceled.

## **Alcohol and Tobacco: 24 Hours**

- Do not drink any alcohol 24 hours before your scheduled arrival time.
- Do not smoke, vape, use chewing tobacco or use any other tobacco products up to 24 hours before your scheduled arrival time.

## **Regular Foods: 8 Hours**

- Eat your regular foods up to 8 hours before your scheduled arrival time.

## **Light Solid Foods: 6 Hours**

- You may eat light solid foods up to 6 hours before your scheduled arrival time. A light meal is:
  - juice or coffee with milk or cream
  - 1 piece of toast or 1 bowl of oatmeal or hot cereal.
- Do not eat any nuts or nut butters.
- Do not eat foods that are heavy or high in fat such as meat or fried foods.

## **Clear Liquids: 2 Hours**

- Drink only clear liquids up to 2 hours before your scheduled arrival time.
  - Drink water, fruit juice without pulp, black coffee, clear pop or tea.
  - Do not have milk, yogurt or energy drinks.

## **Medicines**

- Take your medicines as directed with a small sip of water.

# Cleansing Your Skin for Your Surgery

Washing your skin with Hibiclens® removes most of the bacteria that is normally found on your skin. This also helps prevent infection at the incision site.

You will be given Hibiclens soap packets at your doctor's office. If you do not receive the packets, you can purchase a bottle of Hibiclens soap at your local pharmacy.

You will need to take **two** showers or baths before surgery:

- one in the evening before surgery
- one on the morning of surgery before you come to the hospital.

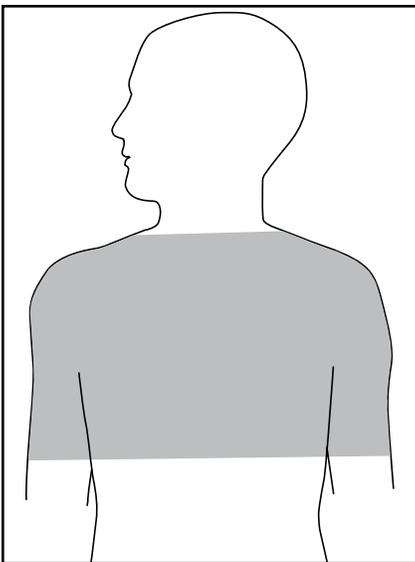
If you have Hibiclens soap packets, you will use one packet for each shower.

If you have a bottle of Hibiclens soap, you will use half of the bottle for your evening shower and the rest of the bottle for your morning shower.

## What to Do

### The evening before surgery:

1. Take a shower or bath and wash your body and hair using your usual soap and shampoo and conditioner.
2. Rinse your body.
3. Pour some of the Hibiclens on a clean washcloth.  
**Note:** Hibiclens does not foam or make suds.
4. Wash the front of your upper chest and in the armpit area on the affected side for a total of 5 minutes.
5. Avoid getting Hibiclens in your eyes or ears or on your face.
6. Rinse off your body.
7. Dry off with a clean towel.
8. Do not apply skin lotions, oils, powders, perfumes or deodorant.



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**Wash the front of your upper chest and in the armpit area on the affected side well both the evening before and the morning of surgery.**

### The morning of surgery:

- Repeat the process listed above. You do not have to wash your hair again.



# Chapter 3: Your Surgery and Hospital Stay

## The Morning of Your Surgery

- If you were given instructions by your primary care provider to take medicines the morning of your surgery, take them as directed with a small sip of water.
- Bathe or shower using the “Cleansing Your Skin for Your Surgery” instructions on page 27 or as directed by your doctor.
- Put on clean, comfortable clothes to wear to the hospital.
- Do not wear make-up, deodorant, perfume, cologne or aftershave.
- Arrive at the hospital 2 to 2 ½ hours before your surgery.
- You will have visits from members of your health care team.
  - Your nurse will meet with you to complete your care plan, review what you can expect before and after your surgery and answer any questions.
  - Your surgeon will visit with you and answer any last minute questions you may have. During this visit, you can tell your surgeon whom to talk to after your surgery.
  - Your anesthesiologist will also meet with you. They will review your medical history, talk about the anesthesia that will be used during your surgery and answer any questions.
  - Your nurse anesthetist will review your anesthesia plan, take you to the operating room and stay with you during your surgery.

## What to Expect the Day of Surgery

The surgery will take about 2 to 5 hours but can vary depending on your situation. Your family will be shown where the surgery waiting areas are located.

After surgery you will be taken to a recovery room. You will be monitored closely. The surgeon will speak with members of your family when you are in the recovery room.

During your hospital stay, some of the following equipment may be used:

- Endotracheal tube. This tube is put into your mouth and down your windpipe. It helps control your breathing during surgery. The tube will be removed as soon as you are able to breathe on your own.
- Oxygen. You will be given extra oxygen if needed. Oxygen is given through a small tube in your nose or through a face mask placed over your nose and mouth.
- Heart monitor. A heart monitor records your heartbeats. Three to five sticky pads will be placed on your chest. The pads are attached to wires and a monitor that records your heartbeats.
- Chest tube. A chest tube may be inserted in your side during surgery. The tube is used to drain fluid, blood and air from your chest. The tube is removed when there is no longer an air leak or drainage.
- Foley catheter. This tube is inserted into your bladder to drain urine. The catheter will be removed when you can urinate on your own.
- Incentive spirometer. This breathing device helps maintain healthy lungs after surgery. Use it along with deep breathing and coughing exercises.
- Patient controlled analgesia (PCA) machine. The PCA machine allows you to give your own pain medicine. It has safety features that reduce the risk of getting too much medicine.
- Sequential compression device (SCD). These stockings are used to increase circulation and help prevent blood clots.

# How to Use an Incentive Spirometer



An incentive spirometer is a hand-held breathing exercise device to help you breathe deeply.

## Incentive spirometer

After surgery, it may be difficult to breathe as you normally do. You may notice your breathing changes to small, shallow breaths. This can cause fluid and mucus to build up in your lungs, increasing your risk for respiratory system complications.

An incentive spirometer is a hand-held breathing exercise device to help you breathe deeply. Taking deep breaths allows air to inflate your lungs, opening your airways to prevent fluid and mucus buildup.

Using an incentive spirometer may speed your recovery and lower your risk of lung problems, such as pneumonia.

## How to use the incentive spirometer

1. Sit upright in a chair with your feet flat on the floor. (If you aren't able to sit up in a chair, sit as upright as possible.)
2. Place the spirometer on your bedside table or hold it in an upright position.
3. Place the mouthpiece in your mouth. Seal your lips tightly around the mouthpiece.
4. Inhale as **slowly and deeply** as possible through the mouthpiece. Your health care provider will work with you to set a breathing goal, which will be marked with small arrows on the incentive spirometer. As you inhale, the small square should stay between the arrows.
5. Hold your breath for 3 to 5 seconds. Then exhale slowly through pursed lips. (Pursed lips are in the shape of blowing out a candle.)
6. Repeat 10 times, resting between each time.
7. It is important to cough to clear any secretions. Coughing (clearing your airway) will make breathing easier. It will also strengthen your muscles after each use.

## How often you need to use the incentive spirometer

- **At the hospital:** You will need to use the incentive spirometer 10 times every hour you are awake after surgery.
- **At home:** You will need to use the incentive spirometer 10 times every 2 hours for your first 7 days at home.

# How to Manage Your Pain After Surgery

## Important

Having no pain while in the hospital is not realistic, but pain can be controlled.

Your health care team will work closely with you to help manage your pain during your hospital stay and when you return home.

You and your health care team will establish a “pain goal” – the amount of acceptable pain you can tolerate during your hospital stay.

For most people, a pain goal of 3 or 4 out of 10 is an OK pain level that balances pain control with your ability to do daily activities.

## Types of pain

Pain can last less than 3 to 6 months (acute), last a long time (chronic) or be severe and intense (breakthrough). Pain can come and go with injury, recovery and/or illness.

## Your right to pain management

All patients have the right to have their pain managed. Proper treatment of pain is necessary for you to achieve the best results during your recovery.

If you do not think that your pain is being treated well, please tell your nurse or doctor. They will talk with you about your pain and your pain management needs.

## Pain scale

Using a number scale (0 to 10) to rate your pain will help the health care team members know how severe your pain is and help them make decisions about how to treat it.

### Allina Health Pain Assessment Scale

<b>10</b>	<b>Worst Pain You Can Imagine</b>
<b>7-9</b>	<b>Severe Pain</b> <b>Pain keeps you from doing your regular activities.</b> ⑨ Pain is so bad that you can't do any of your regular activities, including talking or sleeping. ⑧ Pain is so intense that you have trouble talking. ⑦ Pain distracts you and limits your ability to sleep.
<b>4-6</b>	<b>Moderate Pain</b> <b>Pain may interfere with your regular activities.</b> ⑥ Pain makes it hard to concentrate. ⑤ You can't ignore the pain but you can still work through some activities. ④ You can ignore the pain at times.
<b>1-3</b>	<b>Mild Pain</b> <b>Pain doesn't interfere with your regular activities.</b> ③ You may notice the pain but you can tolerate it. ② You may feel some twinges of pain. ① You may barely notice the pain.
<b>0</b>	<b>No Pain</b>

Adapted with permission by Dr. Armaan Singh, 2015.

## ON-Q® PainBuster®

ON-Q PainBuster is a device used to help you manage your pain by sending pain medicine right to your surgical site.

The device consists of a pump and a catheter. Your doctor inserts the catheter into your surgical site during your surgery. A pump is filled with medicine to help you control your pain.

The catheter is connected to the pump that is pre-filled with a local anesthetic.

You and your surgeon will decide if this type of treatment is right for you.

## Your role in managing pain

After surgery, it is common to have some pain at the incision site. As you heal, your incision will look better and the soreness will go away. You may also feel numbness or a “pins and needles” sensation in the area of your incision and sometimes on the side of your chest. This is caused by nerve irritation that can last several weeks or months.

Since you are the only one who knows where and how severe your pain is, you have an important part in managing your pain.

If you have any pain, whether it is at the incision site or somewhere else in your body, tell your nurse or doctor. They will be better able to keep you comfortable if you can describe where and how much it hurts.

All of the following information will help your doctor(s) prescribe the right medicine and therapy for your pain, and avoid serious complications (side effects). Tell your nurse or doctor:

- where you feel pain and how much pain you have (use words to describe how the pain feels)
- what makes your pain better or worse
- what methods of pain control have worked or have not worked well in the past
- if you take pain medicines on a regular basis
- if you have allergies or reactions to pain medicine(s)
- your goals for managing your pain
- what vitamins, herbal and natural products you are taking
- if you smoke
- if you drink more than two alcoholic drinks each day
- if you take illegal (street) drugs
- if you are in a methadone maintenance program.

## Treatments for pain

Managing your pain is more than taking prescription (opioid) pain medicine. There are many different types of treatments for pain including:

- other medicines such as over-the-counter lidocaine 4% patches
- heat or cold (ice packs)
- integrative therapies: music, acupuncture, acupressure, relaxation techniques, massage therapy, aromatherapy
- psychological therapies
- nerve blocks
- transcutaneous electrical stimulation.

## **Pain medicine side effects**

All medicines have some side effects, but not everyone gets them. When side effects occur, it is usually within a few hours after taking the medicine. Most side effects can be managed and go away in time.

Tell your doctor or nurse right away if you have:

- constipation
- sleepiness
- dizziness
- itching and/or rash
- nausea (upset stomach) and vomiting (throwing up)
- slowed breathing
- trouble concentrating
- forgetfulness
- increased anxiety.

## **Pain control can help you**

The right pain control can help:

- you be more comfortable
- you get back to your normal routine
- you participate more completely in your exercises and therapy
- promote healing.

Take pain medicine when pain first begins. If you know your pain may get worse with activity, take your pain medicine before the activity. Don't wait for pain to get worse before taking medicine. Tablets or pills may take up to 30 minutes to begin working. Timing of when to take medicines is important. Talk to your nurse about how to time your pain medicines before activity.

It is important you follow your doctor's instructions for taking pain medicine. If you need help, ask your doctor or pharmacist.

If you have concerns or side effects from pain medicine, call the doctor who prescribed the medicine, or call your primary care provider.

*When medicines are used correctly to manage pain, addiction rarely occurs. If you have concerns about this issue, please talk with your nurse or doctor.*

# Your Hospital Stay

After surgery, you will go from the recovery room to the surgery unit.

## Food and drink

- After your surgery, you may have ice chips and sips of clear liquids.
- You can have a regular diet when you can tolerate clear liquids.
- You may not have a normal appetite right away because of the anesthesia and pain medicine. It's important to eat and drink what you can to help your body heal from surgery.

## Activity

- The goal is that you will sit up in a chair with help the night after your surgery.
- The day after your surgery, you will be sitting up in the chair and walking the halls with help.
- It is important to get up as soon as you can. This will help you recover faster after surgery.
- You will need to walk 5 to 6 times each day.
- You will do arm and shoulder exercises every 2 hours while you are awake. (See exercises on pages 38 to 39.)
- You will set up in a chair for all meals.

## Breathing exercises

- You will need to use your incentive spirometer and do deep breathing exercises. Take 10 breaths with the incentive spirometer every 2 hours while you are awake.
- A respiratory therapist may give you treatments with a medicine to help open up your airways.

## Tubes

- You will have chest tubes placed in your side. The tube(s) are placed while you are still asleep from the anesthesia. The tube(s) will be hooked to a special machine that will collect drainage from your lungs. The tube(s) usually stay in for 48 to 72 hours.
- You may have a catheter in your bladder. If you have one, your nurse will remove it either on the day of surgery or on the first day after surgery.

## Other information

- You will also have chest X-rays done to check how your lungs are re-expanding. This is usually done in your room until you are able to go to the X-ray Department in a wheelchair.
- Your chest tubes will be removed when your lungs are re-expanded and there is no more drainage from the tube.

## Arm and Shoulder Exercises After a Thoracotomy

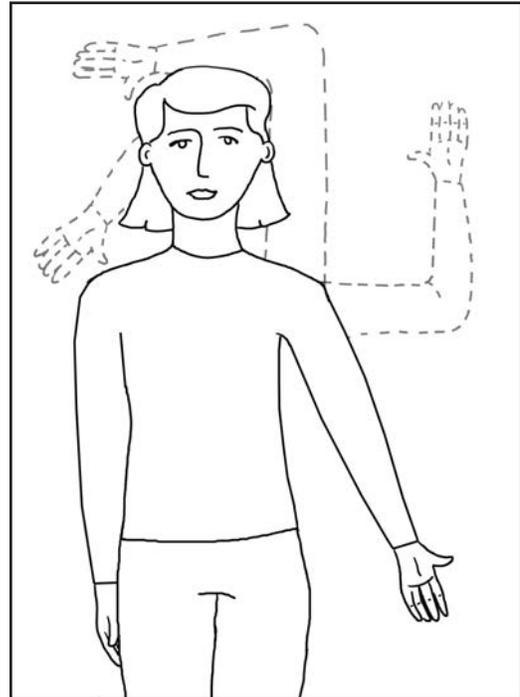
You will start the following exercises soon after your surgery. You should try to do them 2 to 3 times each day. It may be painful at first, but the exercises are needed to maintain your shoulder mobility and prevent more shoulder problems.

At first, nurses will help you. They can give you pain medicine to take before you exercise, if needed.



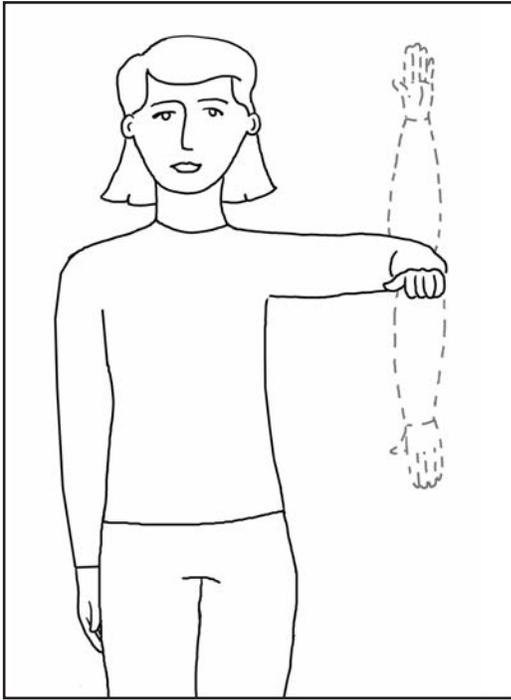
© Allina Health System

- 1. Grasp your arm on the surgery side with your opposite hand. Raise your affected arm above your head and return it to your lap**



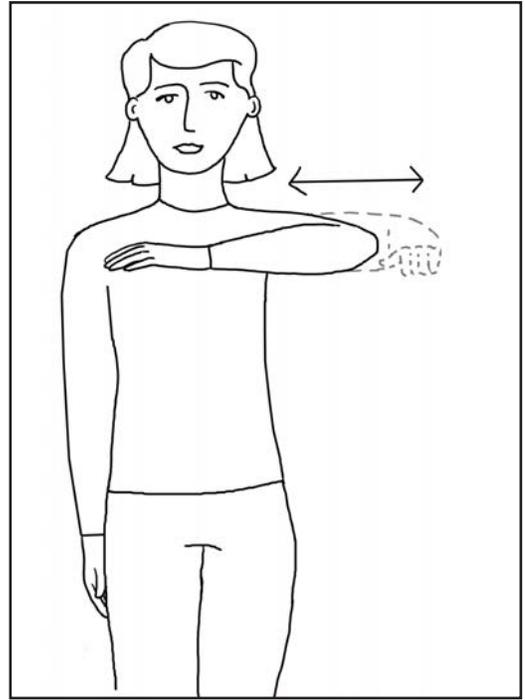
© Allina Health System

- 2. As you gain strength, lift your affected arm over your head and try to touch your opposite shoulder.**



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**3. It is also necessary to maintain shoulder rotation. Lift your affected arm out to the side with your elbow bent. Move your forearm up and down.**



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**4. Lift your affected arm to shoulder height with your elbow bent in front of you. Gently swing your arm in and out.**



# Chapter 4:

## What to Expect at Home After Your Surgery

After your surgery, there is a variety of things you need to know for your safety, recovery and comfort. Before you go home, you will receive instructions on your diet, medicines, activity level, follow-up appointment, and signs and symptoms to watch for.

Within this chapter is a list of commonly asked questions and information about activity, returning to work and support.

If you have any questions, ask your doctor or nurse; they want your recovery to be as smooth as possible.

### Commonly Asked Questions

#### When should you call your doctor?

Call your doctor if:

- you develop a temperature of 101 F or higher
- you have increased pain that cannot be relieved with rest or pain medicines
- your incision becomes red, more tender, has increased drainage, or signs of infection:
  - pain
  - swelling
  - redness
  - odor
  - warmth
  - green or yellow discharge
- you have hives (itchy raised rash)
- you have any new pain or swelling in your legs
- you have problems breathing
- you have chest pain that gets worse with deep breathing or coughing
- you are unable to urinate or have pain or burning when you urinate
- you have any questions of concerns.

**In an emergency, call 911 or have someone take you to the nearest hospital Emergency Department.**

## **When do you need to see your doctor?**

Your doctor or nurse will tell you when to schedule your follow-up appointment. When you get home, call your doctor's office for a surgery follow-up appointment if you do not already have one or if you have any questions or concerns.

## **What are signs and symptoms of an infection?**

Signs and symptoms may include:

- increased redness, swelling or warmth at the incision site
- change in color, amount, odor of drainage
- temperature higher than 101 F.

Call your doctor if you have any of the above signs and/or symptoms.

## **What are signs and symptoms of a blood clot?**

Signs and symptoms may include:

- swelling in one or both legs
- pain or tenderness in one or both legs
- warmth of the skin in the affected leg
- redness or discolored skin in the affected leg
- leg fatigue.

Call your doctor if you have any of the above signs and/or symptoms.

## **What are signs and symptoms of a pulmonary embolism?**

Signs and symptoms may include:

- shortness of breath
- sharp chest pain that may get worse with deep breathing or coughing
- confusion
- sweating.

Call 911 right away if you have any of the above signs and/or symptoms.

## **How do you take care of your incision and change the dressing?**

- You should look at your incision every day and keep it clean while it heals.
- Do not put any creams, salves or ointments on the area.
- If Steri-Strips® (thin paper strips) were used on the incision, they will fall off as the incision heals. They do not need to be replaced. You can remove the Steri-Strips over your incision 1 week after your surgery.
- Change your dressing as directed by your surgeon.

## **Will your incision have drainage after the chest tube is removed?**

Yes. It is normal to have some drainage after the chest tube is removed.

- The chest tube incision site will be covered with a dressing. It is common for the drainage to soak through your dressings for a few days after the chest tube is removed.
- The color of the drainage is usually a light pink or light yellow.
- Once the drainage stops, you can stop covering the chest tube incision site with a dressing.
- You should call your surgeon's office if the drainage is:
  - milky or green in color
  - foul-smelling.

## **How soon can you take a bath or shower?**

- Check with your doctor as to when your incision can get wet.
- You can take a shower as soon as you feel confident to do so.
- Using a tub or shower chair in the bathtub or shower may offer you extra support and comfort until you are able to become more mobile (able to move around).
- Do not take a tub bath until your surgeon says it is OK.

## **When can you return to your normal diet?**

As soon as you are able, eat well-balanced meals to help you recover more quickly and to help you feel your best. What you eat after your surgery affects your well-being. You need to eat healthful meals and drink lots of liquids.

Follow these guidelines to have a balanced diet:

- Resume your normal diet as soon as you can.
- Do not skip meals. Eating three balanced meals is essential to maintain your health.
- Balance your diet between the basic food groups: dairy, meat, fruits, vegetables and grains.

## **How do you manage constipation after surgery?**

It is common for bowel movements to slow after surgery. This can be caused by pain medicines, iron supplements, decreased daily activity and changes in eating habits. Constipation after surgery is common.

Signs of constipation are:

- fewer number of bowel movements
- small, hard stools that are difficult to pass
- feeling bloated and uncomfortable
- gas
- abdominal cramping

## **How to prevent constipation**

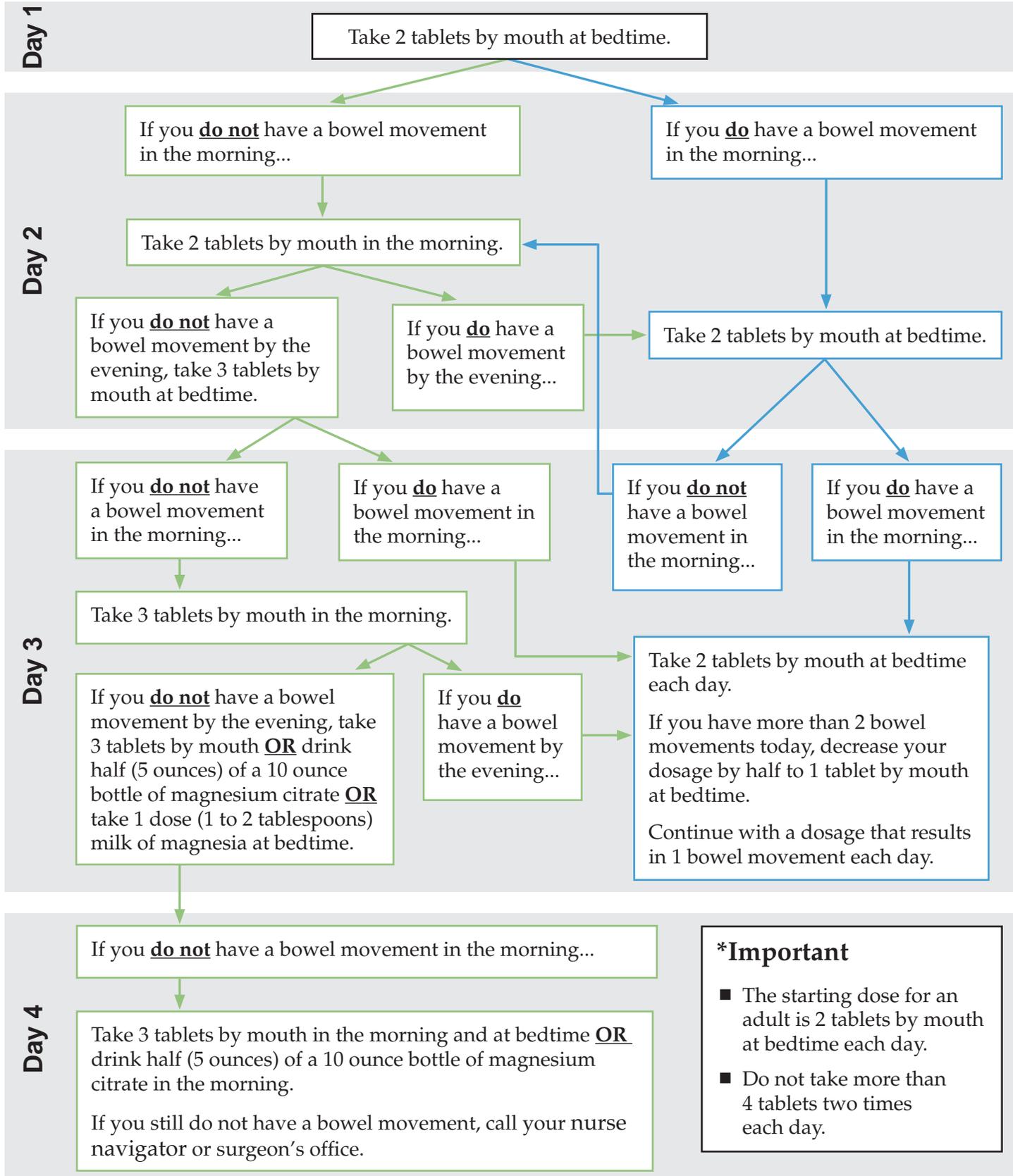
- Drink six to eight 8-ounce glasses of liquids each day.
- Add more fiber to your diet with whole grain bread, bran cereals, fresh fruit and vegetables.
- Be as active as you can each day. Walking around your house or apartment will help. Follow your doctor's instructions for exercise.
- Take less pain medicine, if possible. Follow your doctor's instructions for taking pain medicine.

## **Use of constipation medicines**

As long as you are taking prescription pain medicine, you may be told to take a stool softener. Call your nurse navigator or surgeon's office if you have any questions or concerns about constipation.

# How to take senna with docusate sodium (a laxative and stool softener)\*

Make sure you drink plenty of liquids. If your urine is pale or clear you are drinking enough liquids.



## **How do you manage a cough after surgery?**

A cough after surgery can be caused by the surgery, the duration (length) of anesthesia, a lymph node dissection or acid reflux.

To help manage your cough:

- drink more water
- drink warm tea with honey
- use a humidifier
- use over-the-counter cough drops.

## Activity

- It may take several months before you regain your normal energy level. For your recovery, it is important to get regular physical activity.
  - Walk every day at a pace that is comfortable for you.
  - You may climb stairs as tolerated.
  - You can go outdoors.
  - Take rest periods during the day. If you sleep too much during the day it can affect your sleep at night.
- Continue to use your incentive spirometer every day for the next 2 weeks.
  - Take 10 breaths in a row with the incentive spirometer 3 to 4 times each day.
- Do not drive until your surgeon says it is OK. You may not drive while taking prescription pain medicine.
- Do not lift more than 10 to 15 pounds for the first \_\_\_\_\_ weeks after surgery.
- Exercise your arm on the affected side with gentle motion such as climbing a wall with your fingers and brushing or combing your hair.

## Returning to Work

Talk with your surgeon or nurse about when you can return to work.

The time away from work will depend on your situation. In general, you will need at least 2 to 6 weeks to recover from surgery.

## Support

- You may feel down or depressed. This is normal. You have been through a lot and have some lifestyle changes to make.
- If you have other concerns, please talk with your surgeon or nurse navigator. There is help available such as:
  - support groups
  - licensed psychologists
  - licensed social workers
  - pulmonary rehabilitation
  - The Penny George™ Institute for Health and Healing

## Questions for Your Health Care Team

Here are some sample questions you may want to ask your health care team.

### **Treatment**

What are my treatment options?

What treatment plan do you recommend? Why?

What is the goal of treatment? Is it to get rid of the cancer, help me feel better, or both?

What are the possible side effects of this treatment?

How long will this treatment affect my daily life?

Will I be able to work, exercise and do my normal activities?

Will I be able to go home after surgery?

What is your experience with this type of surgery?

What support services are available to me and my family?

## **Cancer diagnosis and follow-up care**

What type of lung cancer do I have?

What is the stage of my cancer? What does this mean?

What do the results of my pathology report mean?

What is the chance that the cancer will come back?

What follow-up tests will I need and how often will I need them?

Who will be leading my follow-up care?

What tests will I have during my follow-up care?

## **Quitting tobacco use**

What are the benefits of quitting tobacco, even after a cancer diagnosis?



# Chapter 5: Support Services and Resources

Support services are available on an individual basis and in many group settings. Ask your nurse navigator for more information on the support services listed and how to make an appointment.

## Cancer Rehabilitation Program

Your health care team may refer you to the Cancer Rehabilitation Program. This program offers consultations by health care providers who specialize in physical medicine and rehabilitation, and therapists who have advanced training in cancer rehabilitation.

Before treatment, rehabilitation can help build your overall strength and endurance. During treatment, it can help you maintain mobility and reduce pain and discomfort. After treatment, it can help you regain function, decrease fatigue and build strength.

These health care providers provide care options to address the unique needs of people who have cancer such as:

- balance and coordination
- thinking and processing information
- trouble with eating and swallowing
- pain and fatigue
- muscular strength and range of motion
- weakness.

For more information, please talk with a member of your health care team.

## Social Services

A social worker is available to support you and your family during your treatment and recovery. A social worker can:

- help find information and get referrals to community resources
- talk about any concerns that may come up during treatment such as financial, employment or transportation
- provide individual and family counseling to help you and your family cope with the emotional side of cancer
- help guide adults on how to talk with children about cancer and the changes it can often bring to the family.

# Pulmonary Rehabilitation

Your health care team may refer you to pulmonary rehabilitation (respiratory therapy) to help improve your breathing.

Pulmonary rehabilitation will help you learn how to improve your stamina and endurance for a more active life. Program content includes support, education and exercise in every session.

Educational topics include:

- medicines, including drug interaction, using an inhaler and self-care techniques
- understanding and using oxygen therapy
- diet, nutrition and weight management
- breathing retraining and strategies for managing breathing problems
- importance of exercise
- strategies for managing breathing problems
- symptom assessment and knowledge about when to get medical treatment
- stress management
- community resources.

Benefits include:

- develop a self-management strategy
- promote behavioral change in everyday life
- decrease symptoms of disease
- promote ability to function better in daily life
- help increase ability to exercise
- provide tools to better manage anxiety and depression
- promote smoking cessation and good nutrition
- help prevent hospital readmissions.

## Websites

- **A Breath of Hope (Ambassador Program)**  
[abreathofhope.org](http://abreathofhope.org)
- **American Cancer Society**  
[cancer.org/cancer/lungcancer-non-smallcell/index](http://cancer.org/cancer/lungcancer-non-smallcell/index)
- **Angel Foundation**  
[mngel.org](http://mngel.org)
- **Lung Cancer Alliance**  
[lungcanceralliance.org](http://lungcanceralliance.org)
- **Lung Cancer Research Council**  
[lungcancerresearchcouncil.org](http://lungcancerresearchcouncil.org)
- **LUNGevity**  
[lungevity.org](http://lungevity.org)
- **National Cancer Institute**  
[cancer.gov/types/lung](http://cancer.gov/types/lung)
- **National Coalition for Cancer Survivorship**  
[canceradvocacy.org/toolbox](http://canceradvocacy.org/toolbox)
- **National Comprehensive Cancer Network®**  
[nccn.org/patients](http://nccn.org/patients)
- **Open Arms of Minnesota**  
[openarmsmn.org](http://openarmsmn.org)





## Directions for My Medicine List

1. **ALWAYS KEEP THIS FORM WITH YOU.** You may want to fold it and keep it in your wallet along with your driver's license. Then it will be available in case of an emergency.
2. Write down all of the medicines you are taking and list all of your allergies. Add information on medicines taken in clinics, hospitals and other health care settings — as well as at home.
3. Take this form with you on all visits to your clinic, pharmacy, hospital, physician, or other providers.
4. **WRITE DOWN ALL CHANGES MADE TO YOUR MEDICINES** on this form. When you stop taking a certain medicine, write the date it was stopped. If help is needed, ask your doctor, nurse, pharmacist, or family member to help you keep it up-to-date.
5. In the "Notes" column, write down why you are taking the medicine (Examples: high blood pressure, high blood sugar, high cholesterol).
6. When you are discharged from the hospital, someone will talk with you about which medicines to take and which medicines to stop taking. Since many changes are often made after a hospital stay, a new list may be filled out. When you return to your doctor, take your list with you. This will keep everyone up-to-date on your medicines.

## How does this form help you?

- This form helps you and your family members remember all of the medicines you are taking.
- It provides your doctors and other providers with a current list of ALL of your medicines. They need to know the herbals, vitamins, and over-the-counter medicines you take!
- With this information, doctors and other providers can prevent potential health problems, triggered by how different medicines interact.



For copies of the My Medicine List and a brochure with more tips, visit the Minnesota Alliance for Patient Safety's Web site at [www.mnpatientsafety.org](http://www.mnpatientsafety.org) or call (651) 641-1121.

# Get connected

## Communicate with your Allina Health clinic, hospital and provider

Sign up for your free Allina Health account and get instant access to your health information. You can:

- schedule appointments
- get lab results
- email your care team
- manage a child or another adult's account
- and more!

### Fewer steps. Greater access.

- email with your care team\*
- view immunizations
- read visit notes\* and follow-up instructions



### Never run out. We're always open online.

- refill prescriptions at Allina Health pharmacies with the click of a button



## Sign up for your account at [allinahealth.org](http://allinahealth.org) today

*Your account is a free service of Allina Health.*

\*Availability varies by location. Ask your clinic or hospital if this service is available.

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### On the calendar. Off your mind.

- quickly schedule appointments\*
- do online visits for common conditions



### Less waiting. More knowing

- get lab results fast – usually same day



### Small effort. Big reward.

- take a wellness assessment
- set and track health goals
- create a health care directive





# Nondiscrimination in Health Programs and Activities

## *Affordable Care Act – Section 1557*

Allina Health complies with applicable federal civil rights laws and does not discriminate on the basis of race, color, national origin, age, disability, gender identity or sex. Allina Health does not exclude people or treat them differently because of race, color, national origin, age, disability, gender identity or sex.

### Allina Health:

- provides free aids and services to people with disabilities to communicate effectively with us, such as:
  - ◊ qualified sign language interpreters, and
  - ◊ written information in other formats (large print, audio, accessible electronic formats, other formats)
- provides free language services to people whose primary language is not English, such as:
  - ◊ qualified interpreters, and
  - ◊ information written in other languages.

If you need these services, ask a member of your care team.

If you believe that Allina Health has failed to provide these services or discriminated in another way on the basis of race, color, national origin, age, disability, gender identity or sex, you can file a grievance with:

Allina Health Grievance Coordinator  
P.O. Box 43  
Minneapolis, MN 55440-0043  
Phone: 612-262-0900  
Fax: 612-262-4370  
GrievanceCoordinator@allina.com

You can file a grievance in person or by mail, fax or email. If you need help filing a grievance, the Allina Health Grievance Coordinator can help you.

You can also file a civil rights complaint with the U.S. Department of Health and Human Services, Office for Civil Rights, electronically through the Office for Civil Rights Complaint Portal, available at <https://ocrportal.hhs.gov/ocr/portal/lobby.jsf>, or by mail or phone at:

U.S. Department of Health and Human Services  
200 Independence Avenue, SW Room 509F, HHH Building  
Washington, D.C. 20201  
1-800-368-1019, 800-537-7697 (TDD)

Complaint forms are available at <http://www.hhs.gov/ocr/office/file/index.html>.





Allina Health

[allinahealth.org](http://allinahealth.org)